SEQUENCE LISTING

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<110> Korpela, Matti
Karp, Matti
Kurittu, Jussi

<120> A New Assay Method

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<141> 2000-04-24

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<151> 1998-11-11

<150> FI 974235
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atcggtattt gtgaaataat actcaggata ataatttaca taaatattat cacgcattag 3300

agaagagcat gacttttta atttaaactt ttcattaaca aatcttgttg atatgaaaat 3360

tttcctttgc tattttaaca gatattaaaa cgggaatagg cgttatattg acgatccatt 3420

cagttagatt aaaaaccttg agcagaaaat ttatattatt atcataatta tgacgaaagt 3480

tacaggccag gaaccacgta gtcagaatct gattttctat atatttgtta tttacatcgt 3540

cataacacaa aaatataaga agcaagtgtt ggtacgacca gttcgcaaga tagttaaaca 3600

gcaacttaag ttgaaattac ccccattaaa tgg atg gca aat atg act aaa aaa 3654
Met Ala Asn Met Thr Lys Lys
1 5

att tca ttc att att aac ggc cag gtt gaa atc ttt ccc gaa agt gat 3702
Ile Ser Phe Ile Ile Asn Gly Gln Val Glu Ile Phe Pro Glu Ser Asp
10 15 20

gat tta gtg caa tcc att aat ttt ggt gat aat agt gtt tac ctg cca 3750
Asp Leu Val Gln Ser Ile Asn Phe Gly Asp Asn Ser Val Tyr Leu Pro
25 30 35

ata ttg aat gac tct cat gta aaa aac att att gat tgt aat gga aat 3798
Ile Leu Asn Asp Ser His Val Lys Asn Ile Ile Asp Cys Asn Gly Asn
40 45 50 55

aac gaa tta cgg ttg cat aac att gtc aat ttt ctc tat acg gta ggg 3846
Asn Glu Leu Arg Leu His Asn Ile Val Asn Phe Leu Tyr Thr Val Gly
60 65 70

caa aga tgg aaa aat gaa gaa tac tca aga cgc agg aca tac att cgt 3894
Gln Arg Trp Lys Asn Glu Glu Tyr Ser Arg Arg Arg Thr Tyr Ile Arg
75 80 85

gac tta aaa aaa tat atg gga tat tca gaa gaa atg gct aag cta gag 3942
Asp Leu Lys Lys Tyr Met Gly Tyr Ser Glu Glu Met Ala Lys Leu Glu
90 95 100

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gcc aat tgg ata tct atg att tta tgt tct aaa ggc ggc ctt tat gat      3990
Ala Asn Trp Ile Ser Met Ile Leu Cys Ser Lys Gly Gly Leu Tyr Asp
    105                 110                 115

gtt gta gaa aat gaa ctt ggt tct cgc cat atc atg gat gaa tgg cta      4038
Val Val Glu Asn Glu Leu Gly Ser Arg His Ile Met Asp Glu Trp Leu
120                 125                 130                 135

cct cag gat gaa agt tat gtt cgg gct ttt ccg aaa ggt aaa tct gta      4086
Pro Gln Asp Glu Ser Tyr Val Arg Ala Phe Pro Lys Gly Lys Ser Val
                140                 145                 150

cat ctg ttg gca ggt aat gtt cca tta tct ggg atc atg tct ata tta      4134
His Leu Leu Ala Gly Asn Val Pro Leu Ser Gly Ile Met Ser Ile Leu
            155                 160                 165

cgc gca att tta act aag aat cag tgt att ata aaa aca tcg tca acc      4182
Arg Ala Ile Leu Thr Lys Asn Gln Cys Ile Ile Lys Thr Ser Ser Thr
        170                 175                 180

gat cct ttt acc gct aat gca tta gcg tta agt ttt att gat gta gac      4230
Asp Pro Phe Thr Ala Asn Ala Leu Ala Leu Ser Phe Ile Asp Val Asp
    185                 190                 195

cct aat cat ccg ata acg cgc tct tta tct gtt ata tat tgg ccc cac      4278
Pro Asn His Pro Ile Thr Arg Ser Leu Ser Val Ile Tyr Trp Pro His
200                 205                 210                 215

caa ggt gat aca tca ctc gca aaa gaa att atg cga cat gcg gat gtt      4326
Gln Gly Asp Thr Ser Leu Ala Lys Glu Ile Met Arg His Ala Asp Val
                220                 225                 230

att gtc gct tgg gga ggg cca gat gcg att aat tgg gcg gta gag cat      4374
Ile Val Ala Trp Gly Gly Pro Asp Ala Ile Asn Trp Ala Val Glu His
            235                 240                 245

gcg cca tct tat gct gat gtg att aaa ttt ggt tct aaa aag agt ctt      4422
Ala Pro Ser Tyr Ala Asp Val Ile Lys Phe Gly Ser Lys Lys Ser Leu
        250                 255                 260

tgc att atc gat aat cct gtt gat ttg acg tcc gca gcg aca ggt gcg      4470
Cys Ile Ile Asp Asn Pro Val Asp Leu Thr Ser Ala Ala Thr Gly Ala
    265                 270                 275

gct cat gat gtt tgt ttt tac gat cag cga gct tgt ttt tct gcc caa      4518
Ala His Asp Val Cys Phe Tyr Asp Gln Arg Ala Cys Phe Ser Ala Gln
280                 285                 290                 295

aac ata tat tac atg gga aat cat tat gag gaa ttt aag tta gcg ttg      4566
Asn Ile Tyr Tyr Met Gly Asn His Tyr Glu Glu Phe Lys Leu Ala Leu
                300                 305                 310

ata gaa aaa ctt aat cta tat gcg cat ata tta ccg aat gcc aaa aaa      4614
Ile Glu Lys Leu Asn Leu Tyr Ala His Ile Leu Pro Asn Ala Lys Lys
            315                 320                 325

gat ttt gat gaa aag gcg gcc tat tct tta gtt caa aaa gaa agc ttg      4662
Asp Phe Asp Glu Lys Ala Ala Tyr Ser Leu Val Gln Lys Glu Ser Leu
        330                 335                 340

ttt gct gga tta aaa gta gag gtg gat att cat caa cgt tgg atg att      4710
Phe Ala Gly Leu Lys Val Glu Val Asp Ile His Gln Arg Trp Met Ile
    345                 350                 355
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att gag tca aat gca ggt gtg gaa ttt aat caa cca ctt ggc aga tgt      4758
Ile Glu Ser Asn Ala Gly Val Glu Phe Asn Gln Pro Leu Gly Arg Cys
360                 365                 370                 375

gtg tac ctt cat cac gtc gat aat att gag caa ata ttg cct tat gtt      4806
Val Tyr Leu His His Val Asp Asn Ile Glu Gln Ile Leu Pro Tyr Val
            380                 385                 390

caa aaa aat aag acg caa acc ata tct att ttt cct tgg gag tca tca      4854
Gln Lys Asn Lys Thr Gln Thr Ile Ser Ile Phe Pro Trp Glu Ser Ser
        395                 400                 405

ttt aaa tat cga gat gcg tta gca tta aaa ggt gcg gaa agg att gta      4902
Phe Lys Tyr Arg Asp Ala Leu Ala Leu Lys Gly Ala Glu Arg Ile Val
    410                 415                 420

gaa gca gga atg aat aac ata ttt cga gtt ggt gga tct cat gac gga      4950
Glu Ala Gly Met Asn Asn Ile Phe Arg Val Gly Gly Ser His Asp Gly
425                 430                 435

atg aga ccg ttg caa cga tta gtg aca tat att tct cat gaa agg cca      4998
Met Arg Pro Leu Gln Arg Leu Val Thr Tyr Ile Ser His Glu Arg Pro
440                 445                 450                 455

tct aac tat acg gct aag gat gtt gcg gtt gaa ata gaa cag act cga      5046
Ser Asn Tyr Thr Ala Lys Asp Val Ala Val Glu Ile Glu Gln Thr Arg
            460                 465                 470

ttc ctg gaa gaa gat aag ttc ctt gta ttt gtc cca taataggtaa aagt      5096
Phe Leu Glu Glu Asp Lys Phe Leu Val Phe Val Pro
        475                 480

atg gaa aat gaa tca aaa tat aaa acc atc gac cac gtt att tgt gtt      5144
Met Glu Asn Glu Ser Lys Tyr Lys Thr Ile Asp His Val Ile Cys Val
    485                 490                 495

gaa gga aat aaa aaa att cat gtt tgg gaa acg ctg cca gaa gaa aac      5192
Glu Gly Asn Lys Lys Ile His Val Trp Glu Thr Leu Pro Glu Glu Asn
500                 505                 510                 515

agc cca aag aga aag aat gcc att att att gcg tct ggt ttt gcc cgc      5240
Ser Pro Lys Arg Lys Asn Ala Ile Ile Ile Ala Ser Gly Phe Ala Arg
            520                 525                 530

agg atg gat cat ttt gct ggt ctg gcg gaa tat tta tcg cgg aat gga      5288
Arg Met Asp His Phe Ala Gly Leu Ala Glu Tyr Leu Ser Arg Asn Gly
        535                 540                 545

ttt cat gtg atc cgc tat gat tcg ctt cac cac gtt gga ttg agt tca      5336
Phe His Val Ile Arg Tyr Asp Ser Leu His His Val Gly Leu Ser Ser
    550                 555                 560

ggg aca att gat gaa ttt aca atg tct ata gga aag cag agc ttg tta      5384
Gly Thr Ile Asp Glu Phe Thr Met Ser Ile Gly Lys Gln Ser Leu Leu
565                 570                 575

gca gtg gtt gat tgg tta act aca cga aaa ata aat aac ttc ggt atg      5432
Ala Val Val Asp Trp Leu Thr Thr Arg Lys Ile Asn Asn Phe Gly Met
580                 585                 590                 595

ttg gct tca agc tta tct gcg cgg ata gct tat gca agc cta tct gaa      5480
Leu Ala Ser Ser Leu Ser Ala Arg Ile Ala Tyr Ala Ser Leu Ser Glu
            600                 605                 610
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atc aat gct tcg ttt tta atc acc gca gtc ggt gtt gtt aac tta aga 5528
Ile Asn Ala Ser Phe Leu Ile Thr Ala Val Gly Val Val Asn Leu Arg
615 620 625

tat tct ctt gaa aga gct tta ggg ttt gat tat ctc agt cta ccc att 5576
Tyr Ser Leu Glu Arg Ala Leu Gly Phe Asp Tyr Leu Ser Leu Pro Ile
630 635 640

aat gaa ttg ccg gat aat cta gat ttt gaa ggc cat aaa ttg ggt gct 5624
Asn Glu Leu Pro Asp Asn Leu Asp Phe Glu Gly His Lys Leu Gly Ala
645 650 655

gaa gtc ttt gcg aga gat tgt ctt gat ttt ggt tgg gaa gat tta gct 5672
Glu Val Phe Ala Arg Asp Cys Leu Asp Phe Gly Trp Glu Asp Leu Ala
660 665 670 675

tct aca att aat aac atg atg tat ctt gat ata ccg ttt att gct ttt 5720
Ser Thr Ile Asn Asn Met Met Tyr Leu Asp Ile Pro Phe Ile Ala Phe
680 685 690

act gca aat aac gat aat tgg gtc aag caa gat gaa gtt atc aca ttg 5768
Thr Ala Asn Asn Asp Asn Trp Val Lys Gln Asp Glu Val Ile Thr Leu
695 700 705

tta tca aat att cgt agt aat cga tgc aag ata tat tct ttg tta gga 5816
Leu Ser Asn Ile Arg Ser Asn Arg Cys Lys Ile Tyr Ser Leu Leu Gly
710 715 720

agt tcg cat gac ttg agt gaa aat tta gtg gtc ctg cgc aat ttt tat 5864
Ser Ser His Asp Leu Ser Glu Asn Leu Val Val Leu Arg Asn Phe Tyr
725 730 735

caa tcg gtt acg aaa gcc gct atc gcg atg gat aat gat cat ctg gat 5912
Gln Ser Val Thr Lys Ala Ala Ile Ala Met Asp Asn Asp His Leu Asp
740 745 750 755

att gat gtt gat att act gaa ccg tca ttt gaa cat tta act att gcg 5960
Ile Asp Val Asp Ile Thr Glu Pro Ser Phe Glu His Leu Thr Ile Ala
760 765 770

aca gtc aat gaa cgc cga atg aga att gag att gaa aat caa gca att 6008
Thr Val Asn Glu Arg Arg Met Arg Ile Glu Ile Glu Asn Gln Ala Ile
775 780 785

tct ctg tct taaaatctat tgagatattc tatcactcaa atagcaatat 6057
Ser Leu Ser
790

aaggactctc t atg aaa ttt gga aac ttt ttg ctt aca tac caa cct ccc 6107
Met Lys Phe Gly Asn Phe Leu Leu Thr Tyr Gln Pro Pro
795 800

caa ttt tct caa aca gag gta atg aaa cgt ttg gtt aaa tta ggt cgc 6155
Gln Phe Ser Gln Thr Glu Val Met Lys Arg Leu Val Lys Leu Gly Arg
805 810 815

atc tct gag gag tgt ggt ttt gat acc gta tgg tta ctg gag cat cat 6203
Ile Ser Glu Glu Cys Gly Phe Asp Thr Val Trp Leu Leu Glu His His
820 825 830 835

ttc acg gag ttt ggt ttg ctt ggt aac cct tat gtc gct gct gca tat 6251
Phe Thr Glu Phe Gly Leu Leu Gly Asn Pro Tyr Val Ala Ala Ala Tyr
840 845 850

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tta ctt ggc gcg act aaa aaa ttg aat gta gga act gcc gct att gtt      6299
Leu Leu Gly Ala Thr Lys Lys Leu Asn Val Gly Thr Ala Ala Ile Val
        855                 860                 865

ctt ccc aca gcc cat cca gta cgc caa ctt gaa gat gtg aat tta ttg      6347
Leu Pro Thr Ala His Pro Val Arg Gln Leu Glu Asp Val Asn Leu Leu
    870                 875                 880

gat caa atg tca aaa gga cga ttt cgg ttt ggt att tgc cga ggg ctt      6395
Asp Gln Met Ser Lys Gly Arg Phe Arg Phe Gly Ile Cys Arg Gly Leu
885                 890                 895

tac aac aag gac ttt cgc gta ttc ggc aca gat atg aat aac agt cgc      6443
Tyr Asn Lys Asp Phe Arg Val Phe Gly Thr Asp Met Asn Asn Ser Arg
900                 905                 910                 915

gcc tta gcg gaa tgc tgg tac ggg ctg ata aag aat ggc atg aca gag      6491
Ala Leu Ala Glu Cys Trp Tyr Gly Leu Ile Lys Asn Gly Met Thr Glu
            920                 925                 930

gga tat atg gaa gct gat aat gaa cat atc aag ttc cat aag gta aaa      6539
Gly Tyr Met Glu Ala Asp Asn Glu His Ile Lys Phe His Lys Val Lys
        935                 940                 945

gta aac ccc gcg gcg tat agc aga ggt ggc gca ccg gtt tat gtg gtg      6587
Val Asn Pro Ala Ala Tyr Ser Arg Gly Gly Ala Pro Val Tyr Val Val
    950                 955                 960

gct gaa tca gct tcg acg act gag tgg gct gct caa ttt ggc cta ccg      6635
Ala Glu Ser Ala Ser Thr Thr Glu Trp Ala Ala Gln Phe Gly Leu Pro
965                 970                 975

atg ata tta agt tgg att ata aat act aac gaa aag aaa gca caa ctt      6683
Met Ile Leu Ser Trp Ile Ile Asn Thr Asn Glu Lys Lys Ala Gln Leu
980                 985                 990                 995

gag ctt tat aat gaa  gtg gct caa gaa tat  ggg cac gat att cat       6728
Glu Leu Tyr Asn Glu  Val Ala Gln Glu Tyr  Gly His Asp Ile His
                1000                1005                1010

aat atc gac cat tgc  tta tca tat ata aca  tct gta gat cat gac       6773
Asn Ile Asp His Cys  Leu Ser Tyr Ile Thr  Ser Val Asp His Asp
            1015                1020                1025

tca att aaa gcg aaa  gag att tgc cgg aaa  ttt ctg ggg cat tgg       6818
Ser Ile Lys Ala Lys  Glu Ile Cys Arg Lys  Phe Leu Gly His Trp
        1030                1035                1040

tat gat tct tat gtg  aat gct acg act att  ttt gat gat tca gac       6863
Tyr Asp Ser Tyr Val  Asn Ala Thr Thr Ile  Phe Asp Asp Ser Asp
    1045                1050                1055

caa aca aga ggt tat  gat ttc aat aaa ggg  cag tgg cgt gac ttt       6908
Gln Thr Arg Gly Tyr  Asp Phe Asn Lys Gly  Gln Trp Arg Asp Phe
1060                1065                1070

gta tta aaa gga cat  aaa gat act aat cgc  cgt att gat tac agt       6953
Val Leu Lys Gly His  Lys Asp Thr Asn Arg  Arg Ile Asp Tyr Ser
            1075                1080                1085

tac gaa atc aat ccc  gtg gga acg ccg cag  gaa tgt att gac ata       6998
Tyr Glu Ile Asn Pro  Val Gly Thr Pro Gln  Glu Cys Ile Asp Ile
        1090                1095                1100
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att caa aaa gac att  gat gct aca gga ata  tca aat att tgt tgt        7043
Ile Gln Lys Asp Ile  Asp Ala Thr Gly Ile  Ser Asn Ile Cys Cys
                1105                1110                1115

gga ttt gaa gct aat  gga aca gta gac gaa  att att gct tcc atg        7088
Gly Phe Glu Ala Asn  Gly Thr Val Asp Glu  Ile Ile Ala Ser Met
                1120                1125                1130

aag ctc ttc cag tct  gat gtc atg cca ttt  ctt aaa gaa aaa caa        7133
Lys Leu Phe Gln Ser  Asp Val Met Pro Phe  Leu Lys Glu Lys Gln
                1135                1140                1145

cgt tcg cta tta tat  tagctaagga gaaagaa atg aaa ttt gga ttg  ttc    7183
Arg Ser Leu Leu Tyr                      Met Lys Phe Gly Leu  Phe
                1150                                        1155

ttc ctt aac ttc  atc aat tca aca act  gtt caa gaa caa agt  ata      7228
Phe Leu Asn Phe  Ile Asn Ser Thr Thr  Val Gln Glu Gln Ser  Ile
                1160                1165                1170

gtt cgc atg cag  gaa ata acg gag tat  gtt gat aag ttg aat  ttt      7273
Val Arg Met Gln  Glu Ile Thr Glu Tyr  Val Asp Lys Leu Asn  Phe
                1175                1180                1185

gaa cag att tta  gtg tat gaa aat cat  ttt tca gat aat ggt  gtt      7318
Glu Gln Ile Leu  Val Tyr Glu Asn His  Phe Ser Asp Asn Gly  Val
                1190                1195                1200

gtc ggc gct cct  ctg act gtt tct ggt  ttt ctg ctc ggt tta  aca      7363
Val Gly Ala Pro  Leu Thr Val Ser Gly  Phe Leu Leu Gly Leu  Thr
                1205                1210                1215

gag aaa att aaa  att ggt tca tta aat  cac atc att aca act  cat      7408
Glu Lys Ile Lys  Ile Gly Ser Leu Asn  His Ile Ile Thr Thr  His
                1220                1225                1230

cat cct gtc gcc  ata gcg gag gaa gct  tgc tta ttg gat cag  tta      7453
His Pro Val Ala  Ile Ala Glu Glu Ala  Cys Leu Leu Asp Gln  Leu
                1235                1240                1245

agt gaa ggg aga  ttt att tta ggg ttt  agt gat tgc gaa aaa  aaa      7498
Ser Glu Gly Arg  Phe Ile Leu Gly Phe  Ser Asp Cys Glu Lys  Lys
                1250                1255                1260

gat gaa atg cat  ttt ttt aat cgc ccg  gtt gaa tat caa cag  caa      7543
Asp Glu Met His  Phe Phe Asn Arg Pro  Val Glu Tyr Gln Gln  Gln
                1265                1270                1275

cta ttt gaa gag  tgt tat gaa atc att  aac gat gct tta aca  aca      7588
Leu Phe Glu Glu  Cys Tyr Glu Ile Ile  Asn Asp Ala Leu Thr  Thr
                1280                1285                1290

ggc tat tgt aat  cca gat aac gat ttt  tat agc ttc cct aaa  ata      7633
Gly Tyr Cys Asn  Pro Asp Asn Asp Phe  Tyr Ser Phe Pro Lys  Ile
                1295                1300                1305

tct gta aat ccc  cat gct tat acg cca  ggc gga cct cgg aaa  tat      7678
Ser Val Asn Pro  His Ala Tyr Thr Pro  Gly Gly Pro Arg Lys  Tyr
                1310                1315                1320

gta aca gca acc  agt cat cat att gtt  gag tgg gcg gcc aaa  aaa      7723
Val Thr Ala Thr  Ser His His Ile Val  Glu Trp Ala Ala Lys  Lys
                1325                1330                1335
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ggt att cct ctc  atc ttt aag tgg gat  gat tct aat gat gtt  aga        7768
Gly Ile Pro Leu  Ile Phe Lys Trp Asp  Asp Ser Asn Asp Val  Arg
      1340                1345                      1350

tat gaa tat gct  gaa aga tat aaa gcc  gtt gcg gat aaa tat  gac        7813
Tyr Glu Tyr Ala  Glu Arg Tyr Lys Ala  Val Ala Asp Lys Tyr  Asp
      1355                1360                      1365

gtt gac cta tca  gag ata gac cat cag  tta atg ata tta gtt  aac        7858
Val Asp Leu Ser  Glu Ile Asp His Gln  Leu Met Ile Leu Val  Asn
      1370                1375                      1380

tat aac gaa gat  agt aat aaa gct aaa  caa gag acg cgt gca  ttt        7903
Tyr Asn Glu Asp  Ser Asn Lys Ala Lys  Gln Glu Thr Arg Ala  Phe
      1385                1390                      1395

att agt gat tat  gtt ctt gaa atg cac  cct aat gaa aat ttc  gaa        7948
Ile Ser Asp Tyr  Val Leu Glu Met His  Pro Asn Glu Asn Phe  Glu
      1400                1405                      1410

aat aaa ctt gaa  gaa ata att gca gaa  aac gct gtc gga aat  tat        7993
Asn Lys Leu Glu  Glu Ile Ile Ala Glu  Asn Ala Val Gly Asn  Tyr
      1415                1420                      1425

acg gag tgt ata  act gcg gct aag ttg  gca att gaa aag tgt  ggt        8038
Thr Glu Cys Ile  Thr Ala Ala Lys Leu  Ala Ile Glu Lys Cys  Gly
      1430                1435                      1440

gcg aaa agt gta  ttg ctg tcc ttt gaa  cca atg aat gat ttg  atg        8083
Ala Lys Ser Val  Leu Leu Ser Phe Glu  Pro Met Asn Asp Leu  Met
      1445                1450                      1455

agc caa aaa aat  gta atc aat att gtt  gat gat aat att aag  aag        8128
Ser Gln Lys Asn  Val Ile Asn Ile Val  Asp Asp Asn Ile Lys  Lys
      1460                1465                      1470

tac cac atg gaa  tat acc taatagattt cgagttgcag cgaggcggca            8176
Tyr His Met Glu  Tyr Thr
      1475

agtgaacgaa tccccaggag catagataac tatgtgactg gggtgagtga aagcagccaa    8236

caaagcagca gcttgaaag atg aag ggt  ata aaa gag tat gac  agc agt       8285
                  Met Lys Gly  Ile Lys Glu Tyr Asp  Ser Ser
                        1480                1485

gct gcc ata  ctt tct aat att atc  ttg agg agt aaa aca  ggt atg       8330
Ala Ala Ile  Leu Ser Asn Ile Ile  Leu Arg Ser Lys Thr  Gly Met
      1490                1495                      1500

act tca tat  gtt gat aaa caa gaa  att aca gca agc tca  gaa att       8375
Thr Ser Tyr  Val Asp Lys Gln Glu  Ile Thr Ala Ser Ser  Glu Ile
      1505                1510                      1515

gat gat ttg  att ttt tcg agc gat  cca tta gtg tgg tct  tac gac       8420
Asp Asp Leu  Ile Phe Ser Ser Asp  Pro Leu Val Trp Ser  Tyr Asp
      1520                1525                      1530

gag cag gaa  aaa atc aga aag aaa  ctt gtg ctt gat gca  ttt cgt       8465
Glu Gln Glu  Lys Ile Arg Lys Lys  Leu Val Leu Asp Ala  Phe Arg
      1535                1540                      1545
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aat cat tat  aaa cat tgt cga gaa  tat cgt cac tac tgt  cag gca      8510
Asn His Tyr  Lys His Cys Arg Glu  Tyr Arg His Tyr Cys  Gln Ala
       1550                1555                1560

cac aaa gta  gat gac aat att acg  gaa att gat gac ata  cct gta      8555
His Lys Val  Asp Asp Asn Ile Thr  Glu Ile Asp Asp Ile  Pro Val
       1565                1570                1575

ttc cca aca  tcg gtt ttt aag ttt  act cgc tta tta act  tct cag      8600
Phe Pro Thr  Ser Val Phe Lys Phe  Thr Arg Leu Leu Thr  Ser Gln
       1580                1585                1590

gaa aac gag  att gaa agt tgg ttt  acc agt agc ggc acg  aat ggt      8645
Glu Asn Glu  Ile Glu Ser Trp Phe  Thr Ser Ser Gly Thr  Asn Gly
       1595                1600                1605

tta aaa agt  cag gtg gcg cgt gac  aga tta agt att gag  aga ctc      8690
Leu Lys Ser  Gln Val Ala Arg Asp  Arg Leu Ser Ile Glu  Arg Leu
       1610                1615                1620

tta ggc tct  gtg agt tat ggc atg  aaa tat gtt ggt agt  tgg ttt      8735
Leu Gly Ser  Val Ser Tyr Gly Met  Lys Tyr Val Gly Ser  Trp Phe
       1625                1630                1635

gat cat caa  ata gaa tta gtc aat  ttg gga cca gat aga  ttt aat      8780
Asp His Gln  Ile Glu Leu Val Asn  Leu Gly Pro Asp Arg  Phe Asn
       1640                1645                1650

gct cat aat  att tgg ttt aaa tat  gtt atg agt ttg gtg  gaa ttg      8825
Ala His Asn  Ile Trp Phe Lys Tyr  Val Met Ser Leu Val  Glu Leu
       1655                1660                1665

tta tat cct  acg aca ttt acc gta  aca gaa gaa cga ata  gat ttt      8870
Leu Tyr Pro  Thr Thr Phe Thr Val  Thr Glu Glu Arg Ile  Asp Phe
       1670                1675                1680

gtt aaa aca  ttg aat agt ctt gaa  cga ata aaa aat caa  ggg aaa      8915
Val Lys Thr  Leu Asn Ser Leu Glu  Arg Ile Lys Asn Gln  Gly Lys
       1685                1690                1695

gat ctt tgt  ctt att ggt tcg cca  tac ttt att tat tta  ctc tgc      8960
Asp Leu Cys  Leu Ile Gly Ser Pro  Tyr Phe Ile Tyr Leu  Leu Cys
       1700                1705                1710

cat tat atg  aaa gat aaa aaa atc  tca ttt tct gga gat  aaa agc      9005
His Tyr Met  Lys Asp Lys Lys Ile  Ser Phe Ser Gly Asp  Lys Ser
       1715                1720                1725

ctt tat atc  ata acc gga ggc ggc  tgg aaa agt tac gaa  aaa gaa      9050
Leu Tyr Ile  Ile Thr Gly Gly Gly  Trp Lys Ser Tyr Glu  Lys Glu
       1730                1735                1740

tct ctg aaa  cgt gat gat ttc aat  cat ctt tta ttt gat  act ttc      9095
Ser Leu Lys  Arg Asp Asp Phe Asn  His Leu Leu Phe Asp  Thr Phe
       1745                1750                1755

aat ctc agt  gat att agt cag atc  cga gat ata ttt aat  caa gtt      9140
Asn Leu Ser  Asp Ile Ser Gln Ile  Arg Asp Ile Phe Asn  Gln Val
       1760                1765                1770

gaa ctc aac  act tgt ttc ttt gag  gat gaa atg cag cgt  aaa cat      9185
Glu Leu Asn  Thr Cys Phe Phe Glu  Asp Glu Met Gln Arg  Lys His
       1775                1780                1785
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gtt ccg ccg  tgg gta tat gcg cga  gcg ctt gat cct gaa  acg ttg        9230
Val Pro Pro  Trp Val Tyr Ala Arg  Ala Leu Asp Pro Glu  Thr Leu
        1790                 1795                 1800

aaa cct gta  cct gat gga acg ccg  ggg ttg atg agt tat  atg gat        9275
Lys Pro Val  Pro Asp Gly Thr Pro  Gly Leu Met Ser Tyr  Met Asp
        1805                 1810                 1815

gcg tca gca  acc agt tat cca gca  ttt att gtt acc gat  gat gtc        9320
Ala Ser Ala  Thr Ser Tyr Pro Ala  Phe Ile Val Thr Asp  Asp Val
        1820                 1825                 1830

ggg ata att  agc aga gaa tat ggt  aag tat ccc ggc gtg  ctc gtt        9365
Gly Ile Ile  Ser Arg Glu Tyr Gly  Lys Tyr Pro Gly Val  Leu Val
        1835                 1840                 1845

gaa att tta  cgt cgc gtc aat acg  agg acg cag aaa ggg  tgt gct        9410
Glu Ile Leu  Arg Arg Val Asn Thr  Arg Thr Gln Lys Gly  Cys Ala
        1850                 1855                 1860

tta agc tta  acc gaa gcg ttt gat  agt tgatatcctt tgcctaattg          9457
Leu Ser Leu  Thr Glu Ala Phe Asp  Ser
        1865                 1870

taagtggaat gcttgcgtta tataaatctg aatgacatct acactttaca aaattctcca   9517

aaacatccac atttgggtac ttgatagagg tttatggggt tggcttaaca ttgttctcat   9577

tgttattatt ggctcaaagc aaaaggagat aacatgaaaa aattggcagt tatgcttgca   9637

ttgggaatga ttagctttgg tgcaatggca gttgatgggt ataaagatgc aaagtttggc   9697

atgacagaag aagagtttct ttcgaagagg ttatgtgatt ttgaaaaatt tgagggagat   9757

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cgtgaagcaa tggcattttt tttaaatggg aaatttaaaa gattagagat taatattggc   9877

agacttgtga agccagtaag caaatcgtta acgaaaaagt acggagatgg atcatcgtat   9937

ccatcaaaag aagaatttga gaacgcgcta aaatacaatg gaactatgtc tataggttat   9997

gataataata cggtattagt tgatatacat ataatatgtg gcaaagaagg catagaaacc  10057

agtcaactga tttatacgag tccagatgtt tatacgctcc cagatttcgg agaaaaaatc  10117

caggaattaa agggattaaa ggaattcgag ctcggtaccc ggggatccct cgaggtcgac  10177

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            20                  25                  30
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Asp Asn Ser Val Tyr Leu Pro Ile Leu Asn Asp Ser His Val Lys Asn
35 40 45

Ile Ile Asp Cys Asn Gly Asn Asn Glu Leu Arg Leu His Asn Ile Val
50 55 60

Asn Phe Leu Tyr Thr Val Gly Gln Arg Trp Lys Asn Glu Glu Tyr Ser
65 70 75 80

Arg Arg Arg Thr Tyr Ile Arg Asp Leu Lys Lys Tyr Met Gly Tyr Ser
85 90 95

Glu Glu Met Ala Lys Leu Glu Ala Asn Trp Ile Ser Met Ile Leu Cys
100 105 110

Ser Lys Gly Gly Leu Tyr Asp Val Val Glu Asn Glu Leu Gly Ser Arg
115 120 125

His Ile Met Asp Glu Trp Leu Pro Gln Asp Glu Ser Tyr Val Arg Ala
130 135 140

Phe Pro Lys Gly Lys Ser Val His Leu Leu Ala Gly Asn Val Pro Leu
145 150 155 160

Ser Gly Ile Met Ser Ile Leu Arg Ala Ile Leu Thr Lys Asn Gln Cys
165 170 175

Ile Ile Lys Thr Ser Ser Thr Asp Pro Phe Thr Ala Asn Ala Leu Ala
180 185 190

Leu Ser Phe Ile Asp Val Asp Pro Asn His Pro Ile Thr Arg Ser Leu
195 200 205

Ser Val Ile Tyr Trp Pro His Gln Gly Asp Thr Ser Leu Ala Lys Glu
210 215 220

Ile Met Arg His Ala Asp Val Ile Val Ala Trp Gly Gly Pro Asp Ala
225 230 235 240

Ile Asn Trp Ala Val Glu His Ala Pro Ser Tyr Ala Asp Val Ile Lys
245 250 255

Phe Gly Ser Lys Lys Ser Leu Cys Ile Ile Asp Asn Pro Val Asp Leu
260 265 270

Thr Ser Ala Ala Thr Gly Ala Ala His Asp Val Cys Phe Tyr Asp Gln
275 280 285

Arg Ala Cys Phe Ser Ala Gln Asn Ile Tyr Tyr Met Gly Asn His Tyr
290 295 300

Glu Glu Phe Lys Leu Ala Leu Ile Glu Lys Leu Asn Leu Tyr Ala His
305 310 315 320

Ile Leu Pro Asn Ala Lys Lys Asp Phe Asp Glu Lys Ala Ala Tyr Ser
325 330 335

Leu Val Gln Lys Glu Ser Leu Phe Ala Gly Leu Lys Val Glu Val Asp
340 345 350

Ile His Gln Arg Trp Met Ile Ile Glu Ser Asn Ala Gly Val Glu Phe
355 360 365

Asn Gln Pro Leu Gly Arg Cys Val Tyr Leu His His Val Asp Asn Ile
370 375 380

Glu Gln Ile Leu Pro Tyr Val Gln Lys Asn Lys Thr Gln Thr Ile Ser
385 390 395 400

Ile Phe Pro Trp Glu Ser Ser Phe Lys Tyr Arg Asp Ala Leu Ala Leu
405 410 415

Lys Gly Ala Glu Arg Ile Val Glu Ala Gly Met Asn Asn Ile Phe Arg
420 425 430

Val Gly Gly Ser His Asp Gly Met Arg Pro Leu Gln Arg Leu Val Thr
435 440 445

Tyr Ile Ser His Glu Arg Pro Ser Asn Tyr Thr Ala Lys Asp Val Ala
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<213> Photorhabdus luminescens

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35 40 45

Arg Met Asp His Phe Ala Gly Leu Ala Glu Tyr Leu Ser Arg Asn Gly
50 55 60

Phe His Val Ile Arg Tyr Asp Ser Leu His His Val Gly Leu Ser Ser
65 70 75 80

Gly Thr Ile Asp Glu Phe Thr Met Ser Ile Gly Lys Gln Ser Leu Leu
85 90 95

Ala Val Val Asp Trp Leu Thr Thr Arg Lys Ile Asn Asn Phe Gly Met
100 105 110

Leu Ala Ser Ser Leu Ser Ala Arg Ile Ala Tyr Ala Ser Leu Ser Glu
115 120 125

Ile Asn Ala Ser Phe Leu Ile Thr Ala Val Gly Val Val Asn Leu Arg
130 135 140

Tyr Ser Leu Glu Arg Ala Leu Gly Phe Asp Tyr Leu Ser Leu Pro Ile
145 150 155 160

Asn Glu Leu Pro Asp Asn Leu Asp Phe Glu Gly His Lys Leu Gly Ala
165 170 175

Glu Val Phe Ala Arg Asp Cys Leu Asp Phe Gly Trp Glu Asp Leu Ala
180 185 190

Ser Thr Ile Asn Asn Met Met Tyr Leu Asp Ile Pro Phe Ile Ala Phe
195 200 205

Thr Ala Asn Asn Asp Asn Trp Val Lys Gln Asp Glu Val Ile Thr Leu
210 215 220

Leu Ser Asn Ile Arg Ser Asn Arg Cys Lys Ile Tyr Ser Leu Leu Gly
225 230 235 240

Ser Ser His Asp Leu Ser Glu Asn Leu Val Val Leu Arg Asn Phe Tyr
245 250 255

Gln Ser Val Thr Lys Ala Ala Ile Ala Met Asp Asn Asp His Leu Asp
260 265 270

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Ser Leu Ser
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35 40 45

Phe Gly Leu Leu Gly Asn Pro Tyr Val Ala Ala Ala Tyr Leu Leu Gly
50 55 60

Ala Thr Lys Lys Leu Asn Val Gly Thr Ala Ala Ile Val Leu Pro Thr
65 70 75 80

Ala His Pro Val Arg Gln Leu Glu Asp Val Asn Leu Leu Asp Gln Met
85 90 95

Ser Lys Gly Arg Phe Arg Phe Gly Ile Cys Arg Gly Leu Tyr Asn Lys
100 105 110

Asp Phe Arg Val Phe Gly Thr Asp Met Asn Asn Ser Arg Ala Leu Ala
115 120 125

Glu Cys Trp Tyr Gly Leu Ile Lys Asn Gly Met Thr Glu Gly Tyr Met
130 135 140

Glu Ala Asp Asn Glu His Ile Lys Phe His Lys Val Lys Val Asn Pro
145 150 155 160

Ala Ala Tyr Ser Arg Gly Gly Ala Pro Val Tyr Val Val Ala Glu Ser
165 170 175

Ala Ser Thr Thr Glu Trp Ala Ala Gln Phe Gly Leu Pro Met Ile Leu
180 185 190

Ser Trp Ile Ile Asn Thr Asn Glu Lys Lys Ala Gln Leu Glu Leu Tyr
195 200 205

Asn Glu Val Ala Gln Glu Tyr Gly His Asp Ile His Asn Ile Asp His
210 215 220

Cys Leu Ser Tyr Ile Thr Ser Val Asp His Asp Ser Ile Lys Ala Lys
225 230 235 240

Glu Ile Cys Arg Lys Phe Leu Gly His Trp Tyr Asp Ser Tyr Val Asn
245 250 255

Ala Thr Thr Ile Phe Asp Asp Ser Asp Gln Thr Arg Gly Tyr Asp Phe
260 265 270

Asn Lys Gly Gln Trp Arg Asp Phe Val Leu Lys Gly His Lys Asp Thr
275 280 285

Asn Arg Arg Ile Asp Tyr Ser Tyr Glu Ile Asn Pro Val Gly Thr Pro
290 295 300

Gln Glu Cys Ile Asp Ile Ile Gln Lys Asp Ile Asp Ala Thr Gly Ile
305 310 315 320

Ser Asn Ile Cys Cys Gly Phe Glu Ala Asn Gly Thr Val Asp Glu Ile
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Lys Leu Asn Phe Glu Gln Ile Leu Val Tyr Glu Asn His Phe Ser Asp
35 40 45

Asn Gly Val Val Gly Ala Pro Leu Thr Val Ser Gly Phe Leu Leu Gly
50 55 60

Leu Thr Glu Lys Ile Lys Ile Gly Ser Leu Asn His Ile Ile Thr Thr
65 70 75 80

His His Pro Val Ala Ile Ala Glu Glu Ala Cys Leu Leu Asp Gln Leu
85 90 95

Ser Glu Gly Arg Phe Ile Leu Gly Phe Ser Asp Cys Glu Lys Lys Asp
100 105 110

Glu Met His Phe Phe Asn Arg Pro Val Glu Tyr Gln Gln Gln Leu Phe
115 120 125

Glu Glu Cys Tyr Glu Ile Ile Asn Asp Ala Leu Thr Thr Gly Tyr Cys
130 135 140

Asn Pro Asp Asn Asp Phe Tyr Ser Phe Pro Lys Ile Ser Val Asn Pro
145 150 155 160

His Ala Tyr Thr Pro Gly Gly Pro Arg Lys Tyr Val Thr Ala Thr Ser
165 170 175

His His Ile Val Glu Trp Ala Ala Lys Lys Gly Ile Pro Leu Ile Phe
180 185 190

Lys Trp Asp Asp Ser Asn Asp Val Arg Tyr Glu Tyr Ala Glu Arg Tyr
195 200 205

Lys Ala Val Ala Asp Lys Tyr Asp Val Asp Leu Ser Glu Ile Asp His
210 215 220

Gln Leu Met Ile Leu Val Asn Tyr Asn Glu Asp Ser Asn Lys Ala Lys
225 230 235 240

Gln Glu Thr Arg Ala Phe Ile Ser Asp Tyr Val Leu Glu Met His Pro
245 250 255

Asn Glu Asn Phe Glu Asn Lys Leu Glu Glu Ile Ile Ala Glu Asn Ala
260 265 270

Val Gly Asn Tyr Thr Glu Cys Ile Thr Ala Ala Lys Leu Ala Ile Glu
275 280 285

Lys Cys Gly Ala Lys Ser Val Leu Leu Ser Phe Glu Pro Met Asn Asp
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Lys Tyr His Met Glu Tyr Thr
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35 40 45

Pro Leu Val Trp Ser Tyr Asp Glu Gln Glu Lys Ile Arg Lys Lys Leu
50 55 60

Val Leu Asp Ala Phe Arg Asn His Tyr Lys His Cys Arg Glu Tyr Arg
65 70 75 80

His Tyr Cys Gln Ala His Lys Val Asp Asp Asn Ile Thr Glu Ile Asp
85 90 95

Asp Ile Pro Val Phe Pro Thr Ser Val Phe Lys Phe Thr Arg Leu Leu
100 105 110

Thr Ser Gln Glu Asn Glu Ile Glu Ser Trp Phe Thr Ser Ser Gly Thr
115 120 125

Asn Gly Leu Lys Ser Gln Val Ala Arg Asp Arg Leu Ser Ile Glu Arg
130 135 140

Leu Leu Gly Ser Val Ser Tyr Gly Met Lys Tyr Val Gly Ser Trp Phe
145 150 155 160

Asp His Gln Ile Glu Leu Val Asn Leu Gly Pro Asp Arg Phe Asn Ala
165 170 175

His Asn Ile Trp Phe Lys Tyr Val Met Ser Leu Val Glu Leu Leu Tyr
180 185 190

Pro Thr Thr Phe Thr Val Thr Glu Glu Arg Ile Asp Phe Val Lys Thr
195 200 205

Leu Asn Ser Leu Glu Arg Ile Lys Asn Gln Gly Lys Asp Leu Cys Leu
210 215 220

Ile Gly Ser Pro Tyr Phe Ile Tyr Leu Leu Cys His Tyr Met Lys Asp
225 230 235 240

Lys Lys Ile Ser Phe Ser Gly Asp Lys Ser Leu Tyr Ile Ile Thr Gly
245 250 255

Gly Gly Trp Lys Ser Tyr Glu Lys Glu Ser Leu Lys Arg Asp Asp Phe
260 265 270

Asn His Leu Leu Phe Asp Thr Phe Asn Leu Ser Asp Ile Ser Gln Ile
275 280 285

Arg Asp Ile Phe Asn Gln Val Glu Leu Asn Thr Cys Phe Phe Glu Asp
290 295 300

Glu Met Gln Arg Lys His Val Pro Pro Trp Val Tyr Ala Arg Ala Leu
305 310 315 320

Asp Pro Glu Thr Leu Lys Pro Val Pro Asp Gly Thr Pro Gly Leu Met
325 330 335

Ser Tyr Met Asp Ala Ser Ala Thr Ser Tyr Pro Ala Phe Ile Val Thr
340 345 350

Asp Asp Val Gly Ile Ile Ser Arg Glu Tyr Gly Lys Tyr Pro Gly Val
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gctttcttcc cttcctttct cgccacgttc gccggctttc cccgtcaagc tctaaatcgg 240

gggctccctt tagggttccg atttagtgct ttacggcacc tcgaccccaa aaaacttgat 300

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              1               5                   10

ttt gcg gca ttt tgc ctt cct gtt ttt gct cac cca gaa acg ctg gtg     759
Phe Ala Ala Phe Cys Leu Pro Val Phe Ala His Pro Glu Thr Leu Val
    15                  20                  25

aaa gta aaa gat gct gaa gat cag ttg ggt gca cga gtg ggt tac atc     807
Lys Val Lys Asp Ala Glu Asp Gln Leu Gly Ala Arg Val Gly Tyr Ile
30                  35                  40                  45

gaa ctg gat ctc aac agc ggt aag atc ctt gag agt ttt cgc ccc gaa     855
Glu Leu Asp Leu Asn Ser Gly Lys Ile Leu Glu Ser Phe Arg Pro Glu
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gaa cgt ttt cca atg atg agc act ttt aaa gtt ctg cta tgt ggc gcg     903
Glu Arg Phe Pro Met Met Ser Thr Phe Lys Val Leu Leu Cys Gly Ala
            65                  70                  75

gta tta tcc cgt att gac gcc ggg caa gag caa ctc ggt cgc cgc ata     951
Val Leu Ser Arg Ile Asp Ala Gly Gln Glu Gln Leu Gly Arg Arg Ile
        80                  85                  90

cac tat tct cag aat gac ttg gtt gag tac tca cca gtc aca gaa aag     999
His Tyr Ser Gln Asn Asp Leu Val Glu Tyr Ser Pro Val Thr Glu Lys
    95                  100                 105

cat ctt acg gat ggc atg aca gta aga gaa tta tgc agt gct gcc ata    1047
His Leu Thr Asp Gly Met Thr Val Arg Glu Leu Cys Ser Ala Ala Ile
110                 115                 120                 125

acc atg agt gat aac act gcg gcc aac tta ctt ctg aca acg atc gga    1095
Thr Met Ser Asp Asn Thr Ala Ala Asn Leu Leu Leu Thr Thr Ile Gly
                130                 135                 140

gga ccg aag gag cta acc gct ttt ttg cac aac atg ggg gat cat gta    1143
Gly Pro Lys Glu Leu Thr Ala Phe Leu His Asn Met Gly Asp His Val
            145                 150                 155

act cgc ctt gat cgt tgg gaa ccg gag ctg aat gaa gcc ata cca aac    1191
Thr Arg Leu Asp Arg Trp Glu Pro Glu Leu Asn Glu Ala Ile Pro Asn
        160                 165                 170

gac gag cgt gac acc acg atg cct gta gca atg gca aca acg ttg cgc    1239
Asp Glu Arg Asp Thr Thr Met Pro Val Ala Met Ala Thr Thr Leu Arg
    175                 180                 185

aaa cta tta act ggc gaa cta ctt act cta gct tcc cgg caa caa ttg    1287
Lys Leu Leu Thr Gly Glu Leu Leu Thr Leu Ala Ser Arg Gln Gln Leu
190                 195                 200                 205

ata gac tgg atg gag gcg gat aaa gtt gca gga cca ctt ctg cgc tcg    1335
Ile Asp Trp Met Glu Ala Asp Lys Val Ala Gly Pro Leu Leu Arg Ser
                210                 215                 220

gcc ctt ccg gct ggc tgg ttt att gct gat aaa tct gga gcc ggt gag    1383
Ala Leu Pro Ala Gly Trp Phe Ile Ala Asp Lys Ser Gly Ala Gly Glu
            225                 230                 235

cgt ggc tct cgc ggt atc att gca gca ctg ggg cca gat ggt aag ccc    1431
Arg Gly Ser Arg Gly Ile Ile Ala Ala Leu Gly Pro Asp Gly Lys Pro
        240                 245                 250
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tcc cgt atc gta gtt atc tac acg acg ggg agt cag gca act atg gat      1479
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gaa cga aat aga cag atc gct gag ata ggt gcc tca ctg att aag cat      1527
Glu Arg Asn Arg Gln Ile Ala Glu Ile Gly Ala Ser Leu Ile Lys His
270                 275                 280                 285

tgg taggaattaa tg atg tct cgt tta gat aaa agt aaa gtg att aac agc    1578
Trp               Met Ser Arg Leu Asp Lys Ser Lys Val Ile Asn Ser
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gca tta gag ctg ctt aat gag gtc gga atc gaa ggt tta aca acc cgt      1626
Ala Leu Glu Leu Leu Asn Glu Val Gly Ile Glu Gly Leu Thr Thr Arg
    300                 305                 310

aaa ctc gcc cag aag cta ggt gta gag cag cct aca ttg tat tgg cat      1674
Lys Leu Ala Gln Lys Leu Gly Val Glu Gln Pro Thr Leu Tyr Trp His
315                 320                 325                 330

gta aaa aat aag cgg gct ttg ctc gac gcc tta gcc att gag atg tta      1722
Val Lys Asn Lys Arg Ala Leu Leu Asp Ala Leu Ala Ile Glu Met Leu
                335                 340                 345

gat agg cac cat act cac ttt tgc cct tta gaa ggg gaa agc tgg caa      1770
Asp Arg His His Thr His Phe Cys Pro Leu Glu Gly Glu Ser Trp Gln
            350                 355                 360

gat ttt tta cgt aat aac gct aaa agt ttt aga tgt gct tta cta agt      1818
Asp Phe Leu Arg Asn Asn Ala Lys Ser Phe Arg Cys Ala Leu Leu Ser
        365                 370                 375

cat cgc gat gga gca aaa gta cat tta ggt aca cgg cct aca gaa aaa      1866
His Arg Asp Gly Ala Lys Val His Leu Gly Thr Arg Pro Thr Glu Lys
    380                 385                 390

cag tat gaa act ctc gaa aat caa tta gcc ttt tta tgc caa caa ggt      1914
Gln Tyr Glu Thr Leu Glu Asn Gln Leu Ala Phe Leu Cys Gln Gln Gly
395                 400                 405                 410

ttt tca cta gag aat gca tta tat gca ctc agc gca gtg ggg cat ttt      1962
Phe Ser Leu Glu Asn Ala Leu Tyr Ala Leu Ser Ala Val Gly His Phe
                415                 420                 425

act tta ggt tgc gta ttg gaa gat caa gag cat caa gtc gct aaa gaa      2010
Thr Leu Gly Cys Val Leu Glu Asp Gln Glu His Gln Val Ala Lys Glu
            430                 435                 440

gaa agg gaa aca cct act act gat agt atg ccg cca tta tta cga caa      2058
Glu Arg Glu Thr Pro Thr Thr Asp Ser Met Pro Pro Leu Leu Arg Gln
        445                 450                 455

gct atc gaa tta ttt gat cac caa ggt gca gag cca gcc ttc tta ttc      2106
Ala Ile Glu Leu Phe Asp His Gln Gly Ala Glu Pro Ala Phe Leu Phe
    460                 465                 470

ggc ctt gaa ttg atc ata tgc gga tta gaa aaa caa ctt aaa tgt gaa      2154
Gly Leu Glu Leu Ile Ile Cys Gly Leu Glu Lys Gln Leu Lys Cys Glu
475                 480                 485                 490

agt ggg tct taaaagcagc ataacctttt tccgtgatgg taacttcact              2203
Ser Gly Ser
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35 40 45

Leu Asn Ser Gly Lys Ile Leu Glu Ser Phe Arg Pro Glu Glu Arg Phe
50 55 60

Pro Met Met Ser Thr Phe Lys Val Leu Leu Cys Gly Ala Val Leu Ser
65 70 75 80

Arg Ile Asp Ala Gly Gln Glu Gln Leu Gly Arg Arg Ile His Tyr Ser
85 90 95

Gln Asn Asp Leu Val Glu Tyr Ser Pro Val Thr Glu Lys His Leu Thr
100 105 110

Asp Gly Met Thr Val Arg Glu Leu Cys Ser Ala Ala Ile Thr Met Ser
115 120 125

Asp Asn Thr Ala Ala Asn Leu Leu Leu Thr Thr Ile Gly Gly Pro Lys
130 135 140

Glu Leu Thr Ala Phe Leu His Asn Met Gly Asp His Val Thr Arg Leu
145 150 155 160

Asp Arg Trp Glu Pro Glu Leu Asn Glu Ala Ile Pro Asn Asp Glu Arg
165 170 175

Asp Thr Thr Met Pro Val Ala Met Ala Thr Thr Leu Arg Lys Leu Leu
180 185 190

Thr Gly Glu Leu Leu Thr Leu Ala Ser Arg Gln Gln Leu Ile Asp Trp
195 200 205

Met Glu Ala Asp Lys Val Ala Gly Pro Leu Leu Arg Ser Ala Leu Pro
210 215 220

Ala Gly Trp Phe Ile Ala Asp Lys Ser Gly Ala Gly Glu Arg Gly Ser
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Arg Gly Ile Ile Ala Ala Leu Gly Pro Asp Gly Lys Pro Ser Arg Ile
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Lys Leu Gly Val Glu Gln Pro Thr Leu Tyr Trp His Val Lys Asn Lys
35 40 45

Arg Ala Leu Leu Asp Ala Leu Ala Ile Glu Met Leu Asp Arg His His
50 55 60

Thr His Phe Cys Pro Leu Glu Gly Glu Ser Trp Gln Asp Phe Leu Arg
65 70 75 80

Asn Asn Ala Lys Ser Phe Arg Cys Ala Leu Leu Ser His Arg Asp Gly
85 90 95

Ala Lys Val His Leu Gly Thr Arg Pro Thr Glu Lys Gln Tyr Glu Thr
100 105 110

Leu Glu Asn Gln Leu Ala Phe Leu Cys Gln Gln Gly Phe Ser Leu Glu
115 120 125

Asn Ala Leu Tyr Ala Leu Ser Ala Val Gly His Phe Thr Leu Gly Cys
130 135 140

Val Leu Glu Asp Gln Glu His Gln Val Ala Lys Glu Glu Arg Glu Thr
145 150 155 160

B1

Pro Thr Thr Asp Ser Met Pro Pro Leu Leu Arg Gln Ala Ile Glu Leu
165 170 175

Phe Asp His Gln Gly Ala Glu Pro Ala Phe Leu Phe Gly Leu Glu Leu
180 185 190

Ile Ile Cys Gly Leu Glu Lys Gln Leu Lys Cys Glu Ser Gly Ser
195 200 205